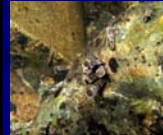


## American River Salmonid Spawning Gravel Augmentation Project



## Why Gravel?

- Provides
  - Spawning habitat for salmonids
  - Rearing habitat for salmonids
  - Habitat for aquatic insects
    - Food for salmonids and other species



## Gravel Blocked by Dams



## Central Valley Project Improvement Act Section 3406(b)(13)

- Develop and implement a continuing program for restoring and replenishing spawning gravel lost due to the construction and operation of Central Valley Project dams, bank protection projects, and other actions that have reduced the availability of spawning gravel and rearing habitat in the Upper Sacramento River, American River, and Stanislaus River.

## Many Fish Die Without Spawning

- High fish density in upper river
- Limited spawning habitat in upper river
- Upper river riffles have large gravel unsuitable for spawning
- More fish than habitat can sustain

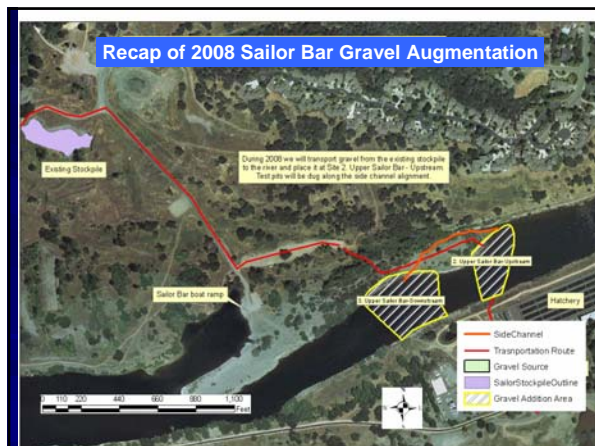


## Rates of gravel loss from primary spawning habitat

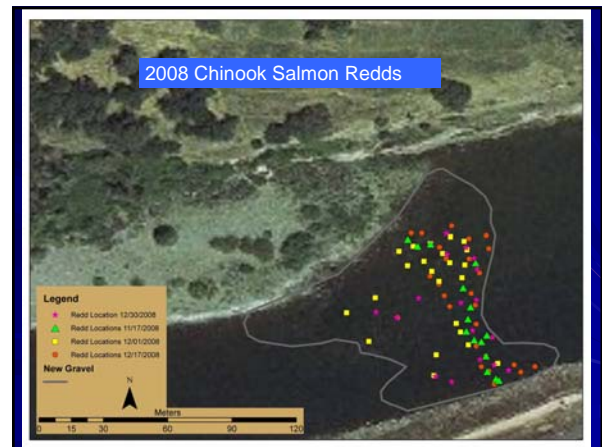
### Rates of Gravel Loss on the Lower American River – Spawning Reaches

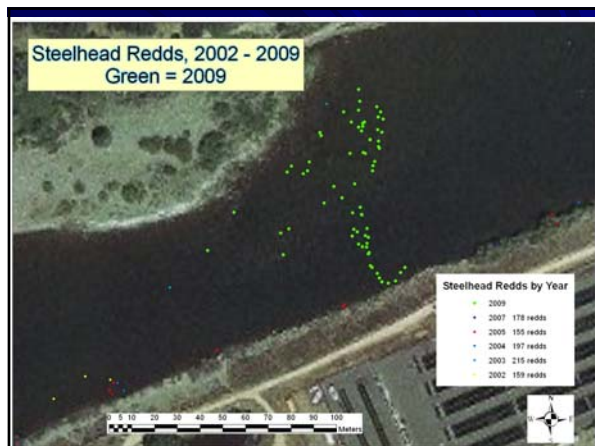
Years	Gravel Loss (m <sup>3</sup> )	Time (years)	Rate of Gravel Loss (m <sup>3</sup> /yr)
1906-1998	3,300,000	92	36,000
1906-1962	1,700,000	56	30,000
1962-1998	1,600,000	36	44,000

pre dam  
vs.  
post dam

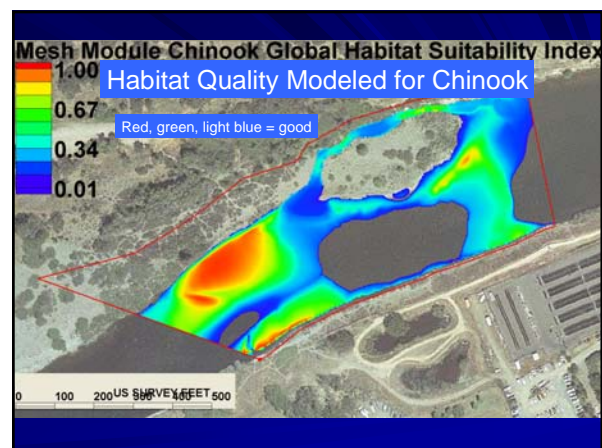
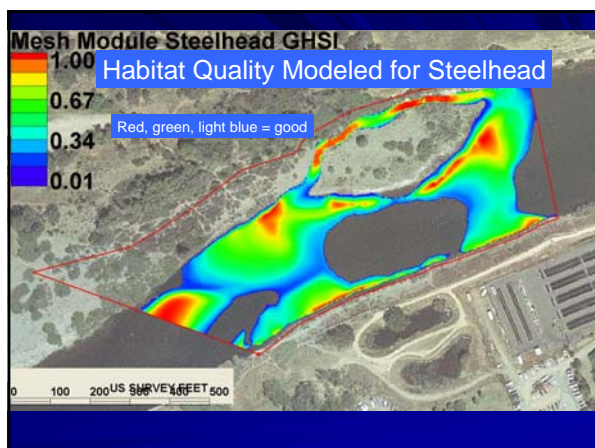
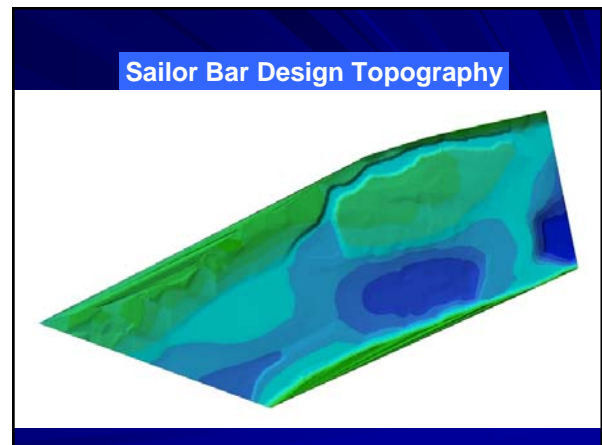




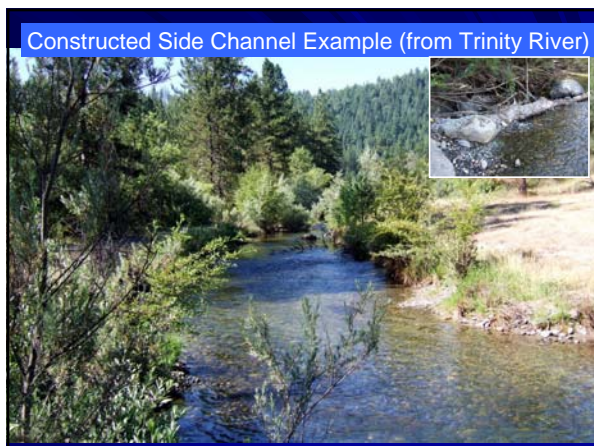
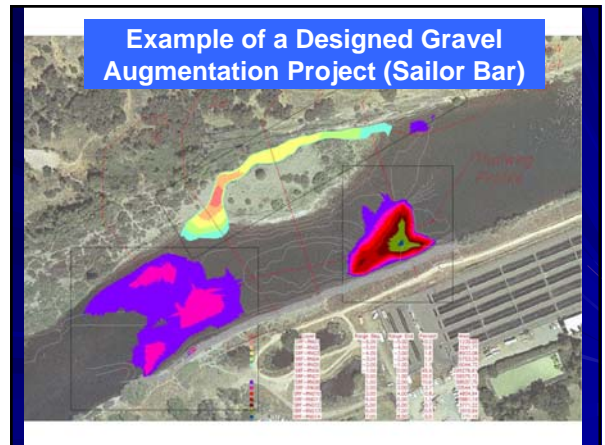




- ## Participants
- Water Forum – coordinaton & permitting
  - Sacramento County Parks – land and gravel
  - CDFG – Instream equipment operators
  - Greg Pasternack – SHIRA assistance
  - Sac State and Cramer Fish Sciences monitoring
  - City of Sacramento - test pitting
  - USFWS – coordination, monitoring, survey
  - Reclamation – engineering, public affairs, survey









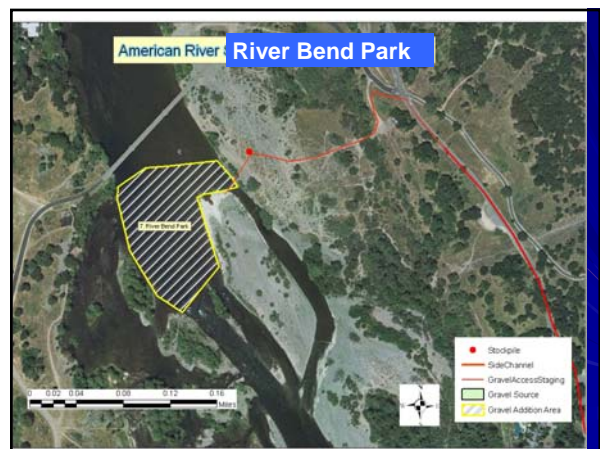
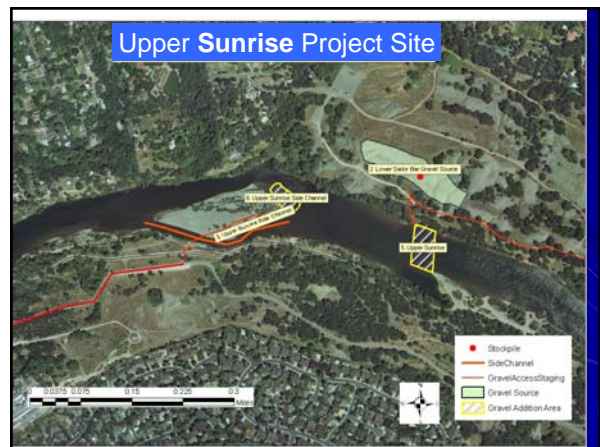
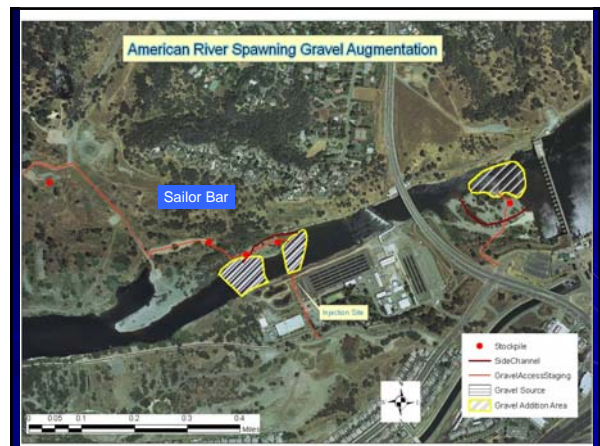


## Questions for 2009

- How deep to dig side channel considering stranding and meander excavation?
- Add islands/rock piles?
- Woody debris in side channel?
- Gravel source? Cleanliness?
- Redistribute top layer of rock in river?
- Complete archaeology on gravel sources?

## 2010 and Beyond

- Prioritization

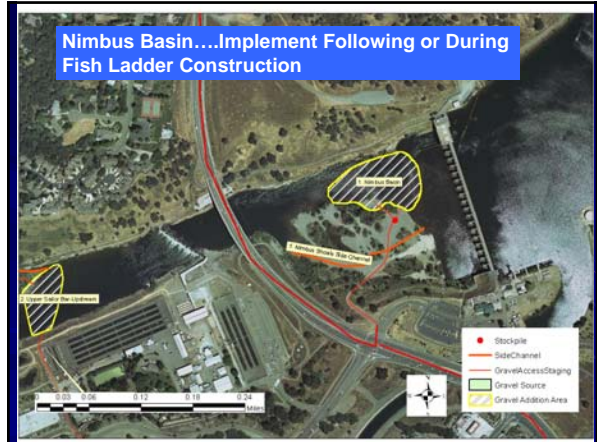




River Bend Park/Arden Rapids Project Site



Nimbus Basin....Implement Following or During Fish Ladder Construction



American River Spawning Gravel Augmentation Transportation Routes



South Fork American in Folsom Reservoir



Public Comment,  
Questions, and Answers



